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Risk Assessment for Microbial Pollution in Drinking Water in Small Community and Relation to Diarrhea Disease

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Abstract: Object of this study is evaluating of health risk in usage of polluted drinking water in small community, located around of Qazvin, Iran and its relative with prevalence of diarrhea diseases. Word health organization has reported that annually 4 billion cases of diarrhea take place world wide, whereas 88 percent of those outbreaks are ascribed to contaminated drinking water [5]. In this study 183 small communities with 10 to 4500 people and total populations of 71171 people were investigated. Results of microbial examinations of drinking water samples, as total coliform, have shown that 73.1 percent of populations have been used contaminated water from march 2005 to February 2006, in 12 months. Investigations in this limited domain were showed that rates of diarrhea outbreak in communities with usage of safe water was 5.3 percent and 8.54 percent in populations with contaminated water. Results were shown that outbreak rates of diarrhea were 69.2 cases in 1000 people in each year and 0.189 in each day. Whereas this rate was 8.94 times fewer than WHO estimated. Also, it was distinguished that rates of diarrhea incidence will be increased with evaluating of environmental temperature. Studying of risk factors was shown that no disinfection had highest role in causing of diarrhea incidence. So in 68 percent of communities chlorination was not performed. It is anticipated that 58605 cases of diarrhea will take place in this domain in next year, if source sanitation and water disinfection do not perform.

Key words: Drinking water · microbial contamination · diarrhea · risk assessment

INTRODUCTION

Epidemiological investigations can provide strong evidence linking exposure to the incidence of diarrhea disease in a population and estimate the magnitude of risk related a particular level of exposure. Also they can specify relation between chance factors and can control risk factors causing gastrointestinal disease [1].

So in this study epidemiology is used as a tool for the assessment of risk. Object of this study is evaluating relation between contaminated water and occurrence of diarrhea in a domain, with usage of epidemiology as a tool for the assessment of risk. Employing risk assessment to control undesirable effects of pollutants on human and environment began before 2 decades ago and it has applied in very cases. Gorter *et al*. [2] has studied effects of water supply and sanitation with outbreak of diarrhea in Nicaragua and they have specified that this rate in children with 500 m distance from source of water in home. Payment *et al*. [3] have used a randomized controlled trail to investigate whether excess gastroenteritis was being caused by potable water supplies. Result of this study estimated the annual incidence of GI illness among tap- water drinker to be 0.76 versus 0.50 among filtered water drinkers. In addition, the result of this study estimated that 35% of the total reported gastroenteritis among tap- water drinker was water- related [4].

Diarrhea occurs in the world-wide and it causes 4% of all deaths and 5% of health loss to disability. It was estimated each year there are 4 billion cases of diarrhea word wide [5]. Agents of water-related diarrhea are very different. They potentially present in contaminated water and are included bacteria, protozoa and viruses [6, 7].This study was designed to determine relationship between temperature of environment, rate of contaminated water in each season of year and verifying incidence of diarrhea in each situation. To attain this object, epidemiological methods, especially risk assessment, was employed.

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